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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,723	07/26/2001	Jacques Penelle	62473	6571

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EXAMINER

SINES, BRIAN J

ART UNIT	PAPER NUMBER
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1743

DATE MAILED: 04/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/915,723

Applicant(s)

PENELLE, JACQUES

Examiner

Brian J. Sines

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 – 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "polymerized matrix" in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation "polymerized matrix" in line 8. There is insufficient antecedent basis for this limitation in the claim.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: The structural relationship between the quartz crystal microbalance sensor and the molecularly imprinted polymer is unclear. Is the molecularly imprinted polymer coating the surface of the quartz crystal microbalance sensor? Is the quartz crystal microbalance sensor positioned within the conduit? The applicants are advised that the structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3 and 5 – 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Potyrailo (U.S. Pat. No. 6,500,547 B1) in view of Schönfeld et al. (U.S. Pat. No. 5,958,787 A) and further in view Yan et al. (U.S. Pat. 5,587,273 A).

Regarding claims 1, 5 and 7, Potyrailo teaches an apparatus comprising: a quartz crystal microbalance sensor having a surface; and a matrix of synthesized monomers (polymerized matrix) coating the surface (see col. 3, lines 65 – 67; col. 4, lines 1 – 12; col. 6, lines 44 – 47).

Potyrailo does not specifically teach the use of a multifunctional monomer for use as an adhesive, wherein the multifunctional monomer adheres the polymerized matrix to the surface of the sensor. However, Schönfeld et al. do teach the incorporation of an intermediate adhesive layer comprising a polymer for the adhesion of a coating onto

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the sensor surface of a quartz crystal (see col. 4, lines 66 – 67; col. 5, lines 1 – 4).

Polymers are known in the art to comprise linked repeating monomer units. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate an adhesive layer comprising a polymer, as taught by Schönfeld et al., to adhere a polymerized matrix coating to the sensor surface of the apparatus taught by Potyrailo in order to facilitate effective coating adhesion, as taught by Schönfeld et al.

Potyrailo does not specifically teach that the polymerized matrix is a molecularly imprinted polymer. Potyrailo does teach that the polymerized matrix coating comprises a fluoropolymer material. Potyrailo teaches that the coating may comprise polytetrafluoroethylene, also known in the art as Teflon (see col. 4, lines 1 – 26). Yan et al. do teach molecularly imprinted materials, which comprise polytetrafluoroethylene (see col. 7, lines 63 – 67; col. 8, lines 1 – 6). Molecularly imprinted polymer sensors are desirable for their specificity in which the polymers can be imprinted for a specific compound, thereby reducing interference, cross-reactivity and false positives.

Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the molecularly imprinted materials comprising polytetrafluoroethylene, as taught by Yan et al., with the sensor apparatus, as taught by Potyrailo in view of Schönfeld et al., in order to fine tune the specificity of the sensor. Furthermore, regarding claim 5, Schönfeld et al. teach that the sensor (20) may be contained within a flow cell (10) comprising a conduit or flow channel, wherein a gas stream (15) to be tested is allowed to flow over the sensor, resulting in a frequency change, which is tested directly with oscillator (17) (see col. 6, lines 51 – 61). Therefore, it would have been obvious to one

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of ordinary skill in the art to incorporate the flow cell comprising a conduit, as taught by Schönfeld et al., with the sensor comprising a molecularly imprinted polymer, as taught Potyrailo in view of Yan et al., in order to provide an effective means of testing a fluid for an analyte or contaminant. Regarding claim 6, Potyrailo teaches the incorporation of a monitoring system with the sensor (see col. 5, lines 11 – 44). Therefore, it would have been obvious to one of ordinary skill in the art to incorporate within the apparatus a microprocessor in communication with the sensor, in which the microprocessor is involved in the detection process, in order to provide for effective analyte detection. Regarding claim 3, Yan et al. teach that the molecularly imprinted materials may comprise acrylic monomers having aromatic linkers (see col. 7, lines 65 – 67; col. 8, lines 1 – 64). Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the molecularly imprinted materials comprising acrylic monomers having aromatic linkers, as taught by Yan et al., with the sensor apparatus, as taught by Potyrailo in view of Schönfeld et al., since the Courts have held that the selection of a known material based upon its suitability for the intended use is within the ambit of one of ordinary skill in the art. See *In re Leshin*, 125 USPQ 416 (CCPA 1960).

### ***Allowable Subject Matter***

Claims 2, 4, 8 and 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, and 35 U.S.C. 103(a) set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The cited prior art as disclosed by Schönfeld et al. do teach the incorporation

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of an intermediate adhesive layer comprising a polymer for the adhesion of a coating onto the sensor surface of a quartz crystal (see col. 4, lines 66 – 67; col. 5, lines 1 – 4). However, the cited prior art neither teach or fairly suggest the incorporation of bis(dehydroalanine) as a multifunctional monomer adhesive for adhering the polymerized matrix coating onto the sensor surface of a quartz crystal microbalance sensor.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Domb '978 teaches the preparation of biologically active molecules by molecular imprinting. Merrill '684 teaches a method and apparatus for detecting contaminants in an aqueous flow using a bulk acoustic wave device comprising a piezoelectric crystal. Mosbach et al. '050 teach supports useful for molecularly imprinted polymer supports formed from at least two distinct acrylic monomers and at least one imprinted molecule.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Sines whose telephone number is (703) 305-0401. The examiner can normally be reached on Monday - Friday (11:30 AM - 8 PM EST).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (703) 308-4037. The fax phone numbers

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for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

BJS  
April 21, 2003

  
Jill Warden  
Supervisory Patent Examiner  
Technology Center 1700